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ABSTRACT

Ninety parents of children (mean age 9.3 years) with Down syndrome and their children's teachers were surveyed to investigate the success of inclusive practices. This study examined responses on parent and teacher questionnaires and parent anecdotal records. Several factors influenced parent reports of successful inclusion experiences, including: (1) preparation of the teacher; (2) format of the curriculum (lesson plans and materials); (3) curricular style of the teacher; (4) classroom management style of the teacher; (5) unity between special education and typical education; (6) parental confidence in professionals; (7) child contact and encouragement from peers; and (8) if the child had friends in class. The teachers found inclusion challenging, rewarding, and of great value to their typical education students as well as children with Down syndrome. The report describes learning characteristics of individuals with Down syndrome and makes suggestions for classroom practice in the areas of attention, memory, concept attainment, meditational strategies and paired associates, transfer of learning, and student motivation. Difficulties in speech and language, reading, and math skills are also described, accompanied by suggestions for classroom practice. Appendices include the parent and teacher surveys. A bibliography with 40 listings is included. (CR)

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The Educational Challenges Inclusion Study

Conducted by
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for the National Down Syndrome Society

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NDSS Board of Directors
October 1996

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*Appendices

A : Parent Questionnaire

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* The following Appendices are available upon request:

C : Distribution Characteristics of Parent Factors

D : Distribution Characteristics of Teacher Factors

E : Correlation Matrix for Parent Questionnaire

F : Correlation Matrix for Teacher Questionnaire

The Meaning of Inclusion and Down Syndrome

Inclusion is the act of including or belonging, being together from beginning to end (American Heritage Dictionary, 1982). From the moment of birth until the time of death, each individual has the intrinsic need to be included in society. The inclusion of people with mental or physical challenges into community settings such as schools, places of employment and neighborhoods has been mandated nationally with Public Law 101-336, or the Americans with Disabilities Act (1990). The purpose of this legislation is to end discrimination against individuals with disabilities in private sector employment, all public services and accommodations, transportation and telecommunications. A specific application of this philosophy was further enhanced by the Individuals with Disabilities Education Act (IDEA or PL 101-476), which greatly expanded the definition of special education to include nondiscriminatory and inclusive education in the least restrictive environment.

Inclusive Education

Inclusive education calls for systematic changes in the educational system. Traditionally, children with special needs have been pulled out or removed from the regular education mainstream and given specialized but separate services until they could "earn" their way back into the regular classroom. This separatist attitude has always been controversial and much research has uncovered lowered teacher expectations of special education students, which have resulted in poor self esteem, limited academic gains, restricted socialization, and minimal involvement in the employment sector (Gresham, 1982; Guralnick, 1981; Wehman, 1985). Parents and professionals have recently advocated strongly for a single education system that could provide an adequate support network for children with different educational needs.

The National Center on Educational Restructuring and Inclusion (NCERI) defines inclusive education as "home school placement" (which means that students attend their home school with their age and grade peers) with the availability of the supports necessary to ensure an appropriate educational experience for the student. Full inclusion is an approach where students with disabilities receive all instruction in a regular classroom setting, and support services come to the students on a "push-in" (to the classroom) basis. Partial inclusion involves students with disabilities receiving most of their instruction in regular education settings, but being "pulled-out" to another instructional setting (such as a resource room) when appropriate to their individual needs.

IDEA enables parents to be involved in the planning and development of their child's educational program. Planning has been shown to be of paramount importance, whether it be formal teacher training through workshops, or informal child or classmate preparation. Formal supports are provided and paid for by the public education system, and include extra staff, adaptive curriculum materials and technological aids. Frequently, when a student with mental or physical challenges is included in a regular education classroom, that regular education teacher also receives the extra help of a full or part-time inclusion aide. Sometimes a consultant teacher acts as a curriculum specialist and provides assistance to the regular

education teacher. Another option is a team-teaching approach, where a regular education teacher is paired with a special education teacher and both share classroom teaching responsibilities. This is sometimes called collaboration. Natural supports are more humanistic and consist of friends, family, professional advocates and classmates who take an active or supportive role in the inclusion experience. Some formal programs have been set up to help foster this humanistic interaction, such as a "Circle of Friends," which focuses on increasing the student's social support network (Perske and Perske, 1988).

- The philosophy or belief that all children, gifted, challenged or at-risk be included for all or part of the day in a regular classroom setting, with appropriate support services for meeting their educational needs;
- treating all children equally in the classroom by providing for the individual needs of each child;
- designing and managing a classroom to maximize the success of all class members; and
- providing a source for future goals, relationships and lifelong friendships.

Inclusion and Children with Down Syndrome

Inclusive education is based on the premise that children of different abilities and backgrounds can benefit both academically and socially in a learning environment that is programmed along with normally achieving students (Banarji and Dailey, 1995). Salisbury (1995) has stated that "the diverse needs of all children can be accommodated to the maximum extent possible within the general education curriculum." Children with Down syndrome have different learning styles that usually require more thought to curricular choices and experiences, which previously has prompted educational programming to be more segregated in nature, involving specialized services and smaller groupings.

Recently, parents of children with Down syndrome have voiced concerns that their children's education in a more specialized program was isolating, particularly when adolescence was reached. They want their children to have friends and be with peers during early childhood and the school years, in preparation for adulthood where they must get along with peers and function in a heterogeneous society. Some parents have gone so far as to forego academic achievement in order to maximize socialization (Salisbury, Gallucci, Palombaro and Pecj, 1995; Stainback and Stainback, 1992). Many parents have questions on the outcomes of inclusive programming and concerns about which methods of support and preparation work best. This prompted the National Down Syndrome Society to initiate a study on inclusion, its effects on children with Down syndrome, and parent and teacher satisfaction.

The Inclusion Study

This study on inclusion and Down syndrome was done to determine the success or lack of success of inclusive practices, and to survey national trends in inclusion programs for children with Down syndrome. This prompted the development and dissemination of two types of questionnaires, one designed to elicit parent case studies and opinions, and the second to examine school organization and what classroom practices teachers were using. Participation in the study was on a voluntary basis. The purpose of the study was to elicit parents and teacher expectations and reactions to their inclusion experiences, and to determine how beneficial they felt it was for a child with Down syndrome. Over 320 questionnaire pairs were mailed to parents of organizations affiliated with NDSS and their children's teachers (grades pre-kindergarten through 12th grade), with steps taken to match up the responses of each child's parents and teachers. Some questions were similar to see if there were any differences between parent and teacher perspectives with regard to inclusion. Several outside school districts were also solicited.

Parent Questionnaire (see Appendix A)

The parent study was designed to obtain write-in responses detailing parents' expectations, prior experience with inclusion, the transition process and their opinions of the professionals involved and their child's adjustment to the process. The following areas were considered as parent components:

- background and previous experience with the school district;
- basic classroom information (teaching arrangement and ratio of staff to students);
- the transition process/degrees of preparation;
- parental involvement and communication with the school;
- the child's adjustment, experiences and (any) behavioral changes; and
- the evaluation of parent and professional attitudes (i.e. contact with professionals, treatment from professionals, and confidence in professional judgments).

Parents also rated how successful they felt that inclusion was for their child in the following areas: academic gains, socialization, independence, language, self-esteem and the development of friendships.

Teacher Questionnaire (see Appendix B)

The teacher study was designed using write-in responses, rating scales (of 1 - 5) and checklists to elicit information detailing their prior experience and expectations, training and preparation, behavior management and classroom operations, instructional curriculum and attitudes toward inclusion. The following areas were considered as teacher components:

- background/teacher information (experience, knowledge of special education and inclusion);
- preparation for inclusion and the transition process;
- classroom information on curriculum, class arrangement, therapies and support services (to include team teaching between regular and special educator, special education consultation, resource room pull-out and/or inclusion aide in the classroom); and
- classroom management, instructional and behavioral strategies and teacher attitude.

Teachers then rated the inclusion experience on how much extra work was required, and how it related to their expectations. The questionnaires were disseminated in spring 1995, and responses were collected through fall 1995. 125 parent and 120 teacher responses were returned, including 90 parent/teacher pairs.

Study Results

125 parent responses and 120 teacher responses were returned. Out of this population, 90 parent/teacher pairs were received. The high response rate to this study indicated high level of interest by its participants. The evaluation was conducted in three parts: an examination of the parent questionnaire, the teacher questionnaire and parent anecdotal records. The intent of this three-part approach was to examine all relevant factors of the questionnaire pairs from different perspectives and to systematically gather and evaluate evidence from various resources to arrive at conclusions regarding the effects of inclusion on education. No judgments were made on the quality of programs; the responses received complete confidentiality; and analyses were descriptive in nature to reflect what practices were currently existing.

Some descriptive statistics of the population are listed below:

. Attend their local neighborhood school	88%
. Mean age of child	9.3 years
. Mean grade of child	3.8
. Mean class size	25 students
. Class contained other students with disabilities beside the child with Down syndrome	56%
. Team teaching situation in class (collaboration)	30%
. Resource room (pull-out) service	32%
. Aide in class specifically for child with Down syndrome (almost all aides were also responsible for work with all of the students in the class)	82%
. Computer in the classroom	72%

Results - Part 1

Programming Outcomes on Parent Perceptions of Success

A successful inclusion experience was determined by parent report of achievement in the following areas (rank-ordered from most common area reported to the area least reported): self-esteem, independence in daily living skills, social interaction, speech and communication and academic achievement. Additionally, parents reported that their children with Down syndrome had good role models among the typical education students; adult attitudes towards the children with Down syndrome were positive; and the curricular style of the class was appropriate for their children. 33% of the parents reported that extra work was necessary at home with homework, and 36% reported a smaller amount of professional services in school (therapies), such as speech therapy or occupational therapy. In more than half of these cases, parents chose to refuse the related professional service offered to them by the school district.

Several factors were examined for the purpose of trying to determine differences between parent reports of successful and unsuccessful inclusion experiences. These were:

- child age and grade;
- teaching arrangements of collaborative or team teaching, resource room placement, and an extra inclusion aide in the class to facilitate the inclusion process;
- presence of computers in class;
- classroom management and parent report of teacher style with their child;
- prior inclusion experience of the child and teacher;
- preparation for inclusion as provided by the school district transition process;
- cooperative attitude of personnel;
- curricular format and materials;
- parental involvement; and
- child contact with peers.

The following tables show the factors that were examined to determine their relationship to parent perception of successful inclusion. It is always necessary to keep in mind that the results came from parents and teachers who chose to return their surveys, and that therefore a bias could be present.

Factors found to have little or no relationship to successful inclusion experiences as reported by the parents:

- child age and grade;
- teaching arrangement: collaborative or team teaching, resource room or extra aide in the class;
- prior inclusion experience of child or teacher;
- presence of computers in the classroom;
- inclusion preparation of child, parents or other students;
- cooperation of principal, higher level administration, regular education teachers, special education teachers, parents of other students in the class;
- parental involvement in planning and school work; and
- behavior problem in class (as rated by the teacher).

Factors found to have a statistically significant relationship to parent report of successful inclusion experiences:

- preparation of the teacher;
- format of the curriculum (lesson plans and materials);
- curricular style of the teacher (as rated by the parents);
- classroom management and style of the teacher (as rated by the parents);
- unity between special education and typical education;
- parental confidence in professionals;
- child contact and encouragement from peers; and
- if the child had friends in class.

Factors found to account for the differences in parents who reported successful inclusion experiences as compared to parents who reported unsuccessful inclusion experiences:

- teacher style with the child (as rated by parents);
- initial easy placement experience (as compared to problematic first experience);
- if the child had friends in class; and
- unity between special education and regular education personnel.

These four factors were able to account for 43% of the difference in responses between successful and unsuccessful experiences, which indicates highly statistically significant and reliable results. These four factors were present in inclusion experiences that were rated as successful by parents, and not found in unsuccessful experiences.

Discussion

Teaching arrangement did not affect parent report of successful inclusion. More important than co-teaching (between special educators and typical educators) in a collaborative fashion, use of a resource room teacher or the extra help of an aide was the individual teacher's style with the child. This leads to the conclusion that the match of any teacher personality and skill to the student is important to successful inclusion practice. Parents stated that they preferred teachers who 1) treated them with respect, 2) had high expectations for the child with Down syndrome and 3) were willing to modify classroom materials as needed. This implies that open-mindedness, enthusiasm and confidence are helpful character traits of teachers for successful inclusion. Teacher preparation programs should also provide training in communication skills for use with parents, and ways that teachers can modify teaching for differently-abled students. This also ties into the many teacher requests for further information of learning characteristics of children with Down syndrome and teaching methods.

Teacher preparation was highly correlated with parent perception of success. Teacher preparation for inclusion has been a focus of much recent research in education (Chalfant and Pysh, 1989; Fuchs, Fuchs and Bahr, 1990; Knackendoffel, Robinson, Deshler and Schumaker, 1992). It is unfortunate that 55% of the teachers in this study reported having no preparation or inclusion training before the inclusion took place.

Administrative attitude did not seem to play a role in a parent's report of success. Research on organizational change and leadership in education has shown that principal and administrative attitude are important to school change and educational achievement (Owens, 1981; Stogdill, 1974). However, the unity between special education and regular education personnel was a highly predictive factor of parent perception of success. This suggests that

administrative attitude may play an indirect part in the fostering of a bonding or collaborative team between the special and regular educators. There is also much anecdotal reporting by parents in this study on the relationships between regular educators and special education personnel. Also, when parents reported a smooth, productive placement process, they found the inclusion experience successful. Those parents who had difficulty with the initial placement reported less satisfaction with the inclusion experience. It seems that first contact impressions tend to set up parent expectations for success or failure. This also indirectly indicates the need for preparation planning.

There did not seem to be any relationship between how involved the parents were in the education of their child, and how satisfied they were with inclusion. This could be due to the fact that there was a small range of variability on this response, with almost all (99%) parents being involved with meetings, their child's IEP and the daily operations of their child's education. Thus, no differences could be compared to successful or unsuccessful inclusion experiences. However, parents who had confidence in the professionals associated with the education of and decision making for their child found inclusion to be more successful than parents who did not have confidence in these professionals.

Whether or not the child was encouraged by their peers or presented a behavior problem in class had no effect on parent perception of successful inclusion. However, parents who reported their children had friends in class also rated the inclusion experience as most successful. This supports the research and anecdotal information that stress the importance to parents that children have friends in the educational environment. Parents stated that they were pleased to have their children join socially in both formal (sports, dances, birthday parties) and informal (playdates) activities.

The variable that showed the highest degree of relationship with report of successful inclusion was the format of the curriculum in the classroom. Teachers who were flexible with the type of student participation and who could alter their use of materials to be more concrete in nature for "hands on" activities were reported to be highly successful catalysts of achievement for students with Down syndrome. Also of importance was curricular style with visible cues as opposed to predominant reliance on auditory language, notetaking and workbooks.

To summarize, parental perception of successful inclusion relied on the factors of initial placement experience, teacher style with the child, the format of the curriculum, the unity between special and regular education, confidence in professionals and whether or not their children have friends in class. Teacher preparation should be increased, and include areas of communication skills, curricular modifications and guidelines for working with special educators. This would suggest that it would be prudent to prepare teachers for skillful curricular design to include visual cues and performance (concrete) activities, as well as education of the learning styles of students with Down syndrome.

Results - Part 2

Teacher Perception of Classroom Management Instructional and Behavioral Strategies

The purpose of the teacher questionnaire was to find out what works with inclusion and what doesn't, according to the typical education teacher's perspective. Little research has been done in this area. There were 120 teacher responses.

Background/Teacher Information: The majority of teachers had a bachelor's degree in education, with extra credits toward a master's or second degree. 63% of the teachers had some special education training through personally selected coursework or workshops. The average number of years experience was 14.

Student Information/Preparation of Teachers: 26% of the respondents taught either nursery school or kindergarten, and it is important to realize that these grades may have differing expectations in the academic area and curriculum. The average class had two other children with some form of special learning need, as well as a child with Down syndrome.

Classroom Information/Curriculum: 55% of the teachers reported receiving no inclusion preparation from the school district. The most common (87% of the cases) teaching arrangement (or inclusion model) entailed the regular teacher working with one additional inclusion aide (87% of the respondents), whose responsibilities included one-on-one tutorial with the child with Down syndrome and whole class assistance. The inclusion aide stays with the child from year to year, and teachers report that this arrangement provides stability with programming instruction. Team teaching between a regular educator and special educator occurred in 30% of the cases, and 51% of the teachers had consulted with a special education teacher during their inclusion experience. 94% of students with Down syndrome received speech services, 62% received occupational therapy and 37% received physical therapy. 46% reported "other" services, typically adaptive physical education and working with a language development specialist. Further study is needed to determine the comparison of "push-in" the classroom and "pull-out" services.

Teacher Arrangement and Instructional Methods: 85% of the classes studied had computers. The average number of computers in classes was 1; the nursery classes did not have computers. The teachers reported that children with Down syndrome effectively used computers for added practice and drill of math and reading skills, as did the other students. Teachers were asked to rate different types of learning arrangements, instructional and behavior management strategies on a scale of 1 (not effective) to 5 (very effective). The best learning arrangements reported were one-on-one and small group instruction. Peer tutors, computers and team teaching were found to be sometimes effective. (This was skewed by the nursery responses, where these methods were not used). Large groups and the whole class were reported not effective at all for students with Down syndrome. A statistical test (T-test) was performed to ensure that the ratings for the top and bottom instructional arrangement

scores were statistically different. The ranking scores between best and worst learning arrangements were significant ($t=17$; $p<.01$). This indicates that differing teacher arrangements and instructional methods for use with children with Down syndrome do have a meaningful impact, with individualized instruction and small groups being the most effective. Classroom arrangements were also examined. The most effective instructional place was reported to be the student's desk area (94 %).

Materials Used: Teachers in the higher grades preferred the blackboard and overhead projector, while nursery, kindergarten and first grade teachers predominantly used informal seating arrangements. When asked to rank order which materials work best for instruction of students with Down syndrome, concrete or "hands-on" materials were reported the most effective. The computer, paper and pencil tasks and textbooks were sometimes effective (only in the upper grades), and workbooks were not found to be useful. The ranking score between the most effective and least effective materials used were statistically significant ($t=12$; $p<.01$). This indicates that the types of materials used in instruction made a tremendous difference when teaching students with Down syndrome. 74 % of the teachers felt that homework was effective for two reasons: 1) to inform parents about what the child was doing in school, and 2) to give the child the necessary extra practice with basic concepts. Of all the adults involved with the students with Down syndrome, the regular education teacher and inclusion aide were reported as the most effective instructors for the child. However, 44 % of the teachers also wrote that peers were extremely effective instructional agents.

Behavior Management: Teachers did not have to modify their behavior management systems for adequate class control due to the addition of a student with Down syndrome. Children with Down syndrome responded to the same behavior management techniques as the rest of the class. Teachers reported that praise was the best behavior management strategy or motivator for a child with Down syndrome. Material rewards, time out, peer pressure, loss of privilege, and contact with parents were reported as sometimes helpful. Ignoring the child's (mis)behavior, reprimands and punishment were not effective at all, possibly because a student with Down syndrome might be unable to link these consequences with his/her inappropriate behavior. The ranking score between the most effective behavior management strategy and least effective behavior management strategy was statistically significant ($t=28$; $p<.01$). This means that teachers who were able to use the more effective behavior management techniques, such as praise, had a much easier time managing the behavior of a child with Down syndrome than those teachers who used the lesser effective techniques of ignoring (mis)behaviors and punishment.

Teacher Attitude: 49 % of the teachers reported that inclusion caused extra work in areas of modifying homework, class assignments, tests, grading procedures and necessitating more contact with the parent. Grading was determined from participation in class, effort and daily work. Homework and test scores were not related to grades. The ranking score between effort of the student (the best) and homework (the least helpful for grading) was statistically significant ($t=18$; $p<.01$). This indicates that teachers evaluated students with Down syndrome on their efforts and participation in class rather than primarily through tests or homework, which was different from the evaluation methods used with the typical education students.

Grading/Evaluation: Whether a child was determined to be an active or passive learner had no significant effect on instructional strategies chosen or student evaluation. Teachers also did not feel that there was unfair attention given to children with Down syndrome. Teachers had high expectations for their students with Down syndrome, and these were unrelated to variables such as staff preparation, model of implementation of inclusion and whether or not the students had behavior problems in class. When recommendations for improvement were requested, in order of highest to lowest, teachers desired more one-on-one individual instructional time, more planning time and more information on learning characteristics of children with Down syndrome. These results were significant ($t=7$; $p<.01$), meaning that all teachers, whether or not they were ineffective or successful, requested more information and time related to planning and instruction. 66 % rated the experience as more rewarding than they anticipated, both for themselves and other classmates.

Discussion

Learning Arrangements and Materials

As can be expected from previous research, teachers found that one-on-one individual instruction or small group instruction worked much better than instruction in large groups or with the whole class. This was one of the original reasons for the design of separate smaller special education classes in the 1950's and 1960's (Kirk and Gallagher, 1983). Materials that worked best were concrete activities or manipulatives (where the student had to perform an activity or skill using objects or teaching materials), and computer-assisted instruction and drill. Sometimes the same materials were used in different ways. One teacher reported that while the rest of her first grade class used Uniflex (small, colored) cubes for counting and adding, her student with Down syndrome sorted the cubes by color. Workbooks were not found to be useful at all. This is not surprising as most workbooks are either heavily dependent on language comprehension (a problem area for students with Down syndrome), or have too many distractions or problems on a page, which is confusing and overwhelming for students with Down syndrome. Doing a workbook page also requires a level of independence which may not be possible for slower learners. Teachers stated that written performance in a workbook does not adequately reflect the knowledge and abilities of students with Down syndrome. Computer-assisted instruction is ideal for these students because it is interactive, non-threatening, self-paced, and programs usually contain small, sequenced steps with a lot of repetition and drill. However, caution should be taken to ensure that computers are only a medium of instruction and do not replace instructional teacher contact. The humanistic nature of teacher-student interaction is necessary for good social development (Hasselbring and Goin, 1989). Also, a few teachers reported that their included students with Down syndrome did not have adequate fine motor coordination to use a keyboard or mouse effectively.

Grading and Behavior Management Strategies

Teachers found that daily physical performance or participation in class, and effort of the student was a much better indicator of learning or grades for students with Down syndrome than tests or homework. This could be tied to the fact that many parents help their children with homework, and therefore homework did not reflect the independent work of these students. However, teachers did feel that homework was very important for the students with Down syndrome because it helped to bridge the gap between home and school, reinforce concepts discussed in class and inform parents about what students were learning. Threat of lower grades was not an effective motivator for students with Down syndrome to work harder and try their best. Teachers stated that they usually graded students with Down syndrome in comparison to their own previous performance rather than norms or the other students. Praise from the teacher was by far the most widely reported best practice for inclusion of students with Down syndrome. One teacher with six years of inclusion experience said that "my children with Down syndrome soak up praise --- the more they get, the more they want and the harder they will work to get it."

Punishment and ignoring inappropriate behavior did not work effectively as behavioral and instructional strategies. It is possible that students with Down syndrome did not understand why they were being punished and it was not adequately explained, so the unwanted behavior continued. Ignoring behavior was also not an effective method for learning, possibly because slower learners generally need highlighted cues and more direct instruction to link concepts of cause and effect. They may not understand the relationships between behavioral causes and consequences unless these are explained. Teachers are generally better off calmly pointing out what behavior is not appropriate and the consequences. Then, following through on rules and contingencies is most important to facilitate learning. Emotional outbursts and punishments are also ineffective as these cause bad feelings for everyone (Westling, 1986).

Teachers reported that they want more one-on-one individual instructional time with students with Down syndrome, and more planning time for instruction. This is especially important if the teacher collaboration (team teaching) paradigm is used in schools. Planning time must be built in for teachers to work together in a consistent fashion. Teachers also requested more information on the learning characteristics of children with Down syndrome. This is provided in a separate section of this report. Teachers did not complain about extra work or added paperwork. They also stated that they did not want more input from parents, but this statistic could be misleading because most teachers said that they had already received a lot of information from the parents. In many cases, teachers said that although they were not prepared by the school district for inclusion, parents prepared them informally, with written material and personal information about their children. In more than one-third of the cases, parents also came into the classroom prior to the onset of inclusion, to prepare the prospective classmates.

The general conclusion of this study is that inclusion of children with Down syndrome, as it exists now, is successful according to both parents and teachers, although there is always room for improvement. Parents mainly report benefits in areas of social interaction, friendships, communication, independence and self-esteem. Teachers find the experience challenging, rewarding and of great value to their typical education students as well as children with Down syndrome. It was surprising that teacher preparation by the school district had no relationship to parent perception of success. Perhaps the type of training that was given was not relevant to teacher needs or requests. It was often difficult to pinpoint direct relationships mainly because of the overlap of factors such as involvement, cooperation, preparation, personality, attitude and parent perception of success. It is also possible that results are skewed by respondents who chose to return their surveys.

Recommendations

These results are encouraging for the continuation of inclusion of students with Down syndrome. The benefits are many to both the students who are included, and to the typical education students as well. These results also have implications for teacher training for inclusion, especially in the areas of behavioral management, instructional strategies and learning characteristics of students with Down syndrome. School districts are also encouraged to schedule more planning time among the teachers, therapists, parents and support personnel, in order to facilitate communication among staff, ensure educational collaboration and provide a smooth process for initial placement. Preparations for inclusion should begin early, at least one year before placement.

Results - Part 3

Anecdotal Vignettes/Parents

Parent questionnaire anecdotes provided much useful information. Parents tended to give examples to emphasize their responses. Consistent patterns emerged along four major themes:

- Teacher personalities make or break the inclusion experiences, especially the personalities of the regular education teacher. The principals selected the inclusion teachers individually and carefully;
- Communication between all personnel and parents is necessary for success;
- Classmates often make up for any shortcomings of the staff. Extra help in the class is not necessarily the way to go; and
- A balance should be struck between the developmental needs of students and chronological advancement. It was helpful to have curriculum geared for the needs of each child, and a multigraded class (1 grade/2 grade; 3 grade/4 grade, etc.).

Teacher Personalities Make or Break the Experience

Teacher Attitude: Most parents reported that the match of teacher personality to the child was crucial to having a successful year. This supported the finding that teacher style with children is a primary predictive factor. Many parents reported having problems with teacher attitude, while only two parents reported the teachers as not being competent to handle their child. One parent summed it up by saying, "Inclusion is no problem. The teachers who don't give it a chance are the problem."

Support of Inclusion by Professionals: Many parents reported that special education teachers were not helpful to the inclusion process. Often, special education teachers were reported as problematic with "poor communication, cooperation and liaison with regular educators." Examples were given of special education teachers insisting on pulling students out of the room for special services rather than remaining in the class to work with a group of students (push-in service). Regular education teachers usually voiced similar complaints, with too much pull-out services, rather than push-in services in the classroom. However, in a few responses the regular educators complained that there were too many adults in the room during push-in services. In a few instances, parents opted to forego speech or occupational therapy so that their child would not be removed from the regular class. A few parents have even moved to different school districts that were known to have better collaboration between special and regular education teachers.

Sharing Responsibility and Communication: Sometimes, the special education teachers had trouble "letting go" of what used to be "their territory" or primary responsibility. One parent reported, "I feel that the special education teacher is of great importance to my son's progress, yet often the biggest obstacle. She does not discuss her agenda with either me or the (regular) third grade teacher." Another parent stated, "I sometimes feel that the special education teacher does not trust the regular teacher to do a good job with my son, and thinks of his time in the regular class as "down time." Similar comments also related to other professionals.

The intent here is not to blame any specific educator for negative inclusion experiences. There were only seven teacher responses from special educators which do not give a balanced viewpoint. However, as unity between special education and regular education teachers was found to be a primary predictive factor of successful inclusion as perceived by parents, future study should focus on possible reasons for discord between the two.

Communication is Necessary for Success

Parents who were more involved and had better communication (e.g. phone calls, informal talks, daily notebook, meetings) felt much better about their child's inclusion experience. More often than not, teachers got most of their pertinent information about children from parents. Daily notebooks were reported as being an invaluable asset for communication, "because I sometimes feel funny about calling my child's teacher at night when I know she is busy with her own family." A few parents reported an interesting trend, "I communicate well with my child's teacher, but I find that in the school there is no communication between teachers!" This has also been stated by the teachers, that "there is never enough time to talk and plan together, and we often cram in several student lessons during a pressured lunch break." Teachers also report the desire to discuss and reflect on results of shared lessons, as well as plan future collaborative lessons. This clearly indicates a need for administrators to set up regular planning times among teachers as an everyday routine.

Classmates Often Make Up For Any Shortcomings of the Staff

Most parents reported that their child's inclusion aide in the class was the professional who worked best with their child, usually because he/she knew their child the longest. However, one-third of the parents preferred not to have an aide present. These parents reported that aides tend to sit next to the child and help the child with everything, which isolates and stigmatizes. One parent said, "I prefer it so much more when my child's aide is out (sick). Then the teacher pairs my child up with several students during the day to keep an eye on progress. My child comes home talking more about other classmates, and I think, feels better about her day."

All parents felt positive about the use of peer tutors in class. One said, "I love it that my son works with a top student in class. He tries to be more independent and do more on his own to be accepted by his peer tutor." Another parent stated, "The only time that I am absolutely sure my daughter is talking to friends is when she works jointly in groups. When the aide is with her the other kids tend to shy away." Parents of older children say that when they ask about school, their children say more about which students they worked with than the actual activity. Teachers also report having to balance work goals with friendly contact among their students with Down syndrome. One teacher stated that "the student with Down syndrome would be content to sit in his cooperative learning group the whole morning, and I must remind someone in the group to keep him focused on the task. Come to think of it, this helps the whole group as well!" Many teachers of sixth grade and higher reported that peer intervention worked better than teacher assistance. It is also interesting to note that very few teachers listed "extra help" as an option for program improvement.

There Needs to be a Balance Between Developmental and Chronological Needs

The discrepancy between slower development and chronological needs of students with Down syndrome as compared to their typical peers is not as apparent in pre-school or kindergarten, where the children assimulate more easily, but becomes more apparent when higher academic expectations are set for the elementary years and upper grades. Many parents and teachers reported difficulty in this area. One teacher's experience reflects the frustration many people feel. "I believe in inclusion and enjoy having this student in my class. It is wonderful when he participates and jokes around with the class. More often though, he has difficulty sustaining interest in his assignments, for which I blame myself. If only I knew what to use to maintain his attention. His parents have been most helpful and optimistic." Other teachers report assigning fewer problems to a page, or giving students with Down syndrome more freedom to choose their work activities. One teacher describes her philosophy, "She finds her own flow for the day. She starts off with the main lesson, as her other classmates do. Then she is free to go to one of the centers for quiet activity. When I pair her up with a student she does sit longer, but she always tries to do her best."

This is the crucial aspect of inclusion, having students learn with their chronologically aged peers when their developmental needs are different. Parents who reported successful inclusion describe their children's teachers as positive motivators who foster independence and self-reliance. The positive classroom atmosphere also motivates children with Down syndrome to achieve academically . Parents also cite independence, language development and self-esteem as great gains which they attribute to the other classmates as role models. One parent even says about her child's case, "My daughter is getting into trouble sometimes because she is so busy chatting with her friends. She has also come home with some objectionable language. This is all part of normal growing up and I am thrilled to have this problem."

The majority of teachers have allowed their students with Down syndrome to remain with the peer group, but modified the curriculum, as they would adapt the curriculum for other students. Many teachers stated that their expectations for students with Down syndrome were lower with respect to mastery of detail, grasp of concepts and retention of learning. Teachers did report having extra work, particularly in modifying assignments and tests, and that they needed to facilitate more one-to-one individual instruction for students with Down syndrome. The consensus was that the benefits were well-worth the extra effort. This attitude has been accepted by the parents, who have reported curricular modifications as being a successful inclusion practice. Some school districts have also gone the route of multiage grading, having a primary group (kindergarten through second grade) and intermediate groups (third/fourth, fifth/sixth). In the high schools, students with Down syndrome were usually placed in modified English or math classes. Parents of children in these programs reflected the same concerns as others: teacher style with students is still important, as well as format of the curriculum. Age of classmates has not come up as a variable much concern.

Learning Characteristics of Individuals with Down Syndrome

To better understand how students with Down syndrome learn, it would be helpful to examine six areas: attention, memory, concept attainment, mediational strategies, transfer of learning and motivation.

Attention

Attention is the ability of an individual to focus on a specific stimulus. Classic research in this area involves discrimination learning tasks (Zeaman and House, 1963; 1979). In this study, a learning problem was presented through a series of visual stimuli, and the subjects (mentally challenged and typical individuals) were asked to choose the correct stimuli using feedback from previous trials. When the data were plotted, the learning curves of mentally challenged individuals showed a large difference in learning style. Those with typical intelligence showed a smooth learning curve, indicating that they are incidental learners, who can select relevant information from a variety of stimuli, form hypotheses and logically choose a response. The subjects who were mentally challenged showed more of a box-like learning curve with a flat line in the beginning of the graph. This indicates that it took them a longer time to identify the correct or relevant information in the problem, and form a hypothesis relating the concepts. However, once they "got it," they performed just as well as the typical learners.

With these results, Zeaman and House developed the two-stage theory of attention: stage one is the ability to attend to the task, while stage two is the ability to identify the relevant stimulus to the problem. They concluded that individuals who are mentally challenged enter the learning situation with a lower capacity to attend to the relevant (as opposed to distracting) stimuli than typical learners. The lower the mental age of the individual, the longer stage one is present. However, once they have mastered the attention stage and have identified the relevant stimulus, they can learn the task, and perform as well. Later attention theorists have pointed out the importance of training students to focus their attention and actively self-monitor its occurrence (Howell, Rueda and Rutherford, 1983; Kneeder and Hallahan, 1981). From these theories some practical methods can be applied to maximize attention for learning.

Suggestions for Classroom Practice

1. Present stimuli or objects that have clear and obvious dimensions, and vary on as few dimensions as possible (e.g. color or size or texture). Otherwise, the student may be responding to a dimension other than what the teacher is expecting.
2. Use attention-getting techniques such as prompts, cues or lighting. You can even make a secret signal with the student for fun.
3. Placing work on a different background color or texture may enhance attention.

4. Remove extraneous distracting stimuli such as pictures on walls, or too many problems on a page. Do not sit the students next to a window, door or high traffic area.
5. Reward correct responses immediately, to ensure that students are associating the reward to what was correctly done.

Memory

Memory has been defined as "the ability to store and retrieve (upon demand) previously experienced sensations and perceptions, even when the stimulus that originally evoked them is no longer present" (Lerner, 1971). There are four basic components of memory: 1) processes, 2) knowledge, 3) strategies and 4) metamemory. The basic *processes* of memory are the actual hardware of the system, or organic structure, which develops by age two. Coincidentally, around two years of age, language abilities expand greatly, and some theorists believe that memory is a factor influencing this growth (Spitz, 1966). The second aspect of memory, *knowledge*, is made up of an individual's past experiences. What one already knows influences what one learns and remembers, because we interpret what we see. For example, think of the different descriptions a police officer, doctor or teacher would give about a car accident. Their varied training and interests may give them each a different perspective about the same occurrence. The *strategies* component of memory are activities that people use to facilitate "memorizing," or storage and retrieval of information in the brain. These range from the very simple and direct, such as rehearsal and repetition, to the complex and sophisticated, such as the development of acronyms. *Metamemory* is the supervisory or regulating mechanism that determines when to use which strategy. It organizes a person's ability to memorize or remember.

Memory theorists for a long time have generally agreed that there are two types of memory, *short-term and long-term* (Ellis, 1963). Once a stimulus passes through the sensory register, it impacts on the short-term memory, which is heavily based on language. An individual's *short-term memory* can handle between five and nine bits of information, which last from 30 seconds to a couple of minutes. From then on, the individual must act with the stimulus, either by performing a behavior or skill, or actively seeking to enter it into *long-term memory*, through the use of a memory strategy. These strategies can either be spontaneously applied, as in the case of an individual with a good memory, or can be improved by training to increase the repertoire of strategies, as in the case of individuals with poor memories. Long-term memory is based on meaningful impressions or relationships, that can last a lifetime. Individuals with Down syndrome typically have poor memory ability for three reasons: they are at a disadvantage for adequate short term memory due to language delays; they have a limited repertoire of memory strategies; and they tend to be "inactive" learners, when it comes to memory (Baumeister, 1981).

Suggestions for Classroom Practice

1. Use labeling or verbal associations to make up for any language deficits related to memory and learning. Use smaller clusters of information and sequence ideas.
2. Repeat and practice skills to promote learning.
3. Select interesting and meaningful tasks which individuals will enjoy repeating.
4. Teach the learner to use rehearsal strategies and practice them.
5. Provide opportunities to practice skills in many contexts and use multisensory approaches, involving hands-on activities.
6. Show patterns in things to be memorized and teach more sophisticated memory tricks.

Concept Attainment

Concepts are used to organize diverse stimuli in a meaningful order. A concept is an expression of a rule by which diversity is brought together and reduced for the efficiency of adaptation to the environment. The use or application of a concept means that re-learning is bypassed.

According to Jean Piaget (1977), each child progresses through stages of development where various cognitive skills are acquired. These are: the sensorimotor stage (birth - 2 years), the preoperational stage (2 - 6 years), concrete operations, (7 - 11 years), and formal operations (12 years and older). In the sensorimotor stage, the infant experiences the environment through sensory experiences and motor activities, and learns to distinguish between him/herself and the world. The preoperational stage involves the use of language and intuitive thought to assimilate culture and concepts. Also, note that memory hardware is now in place, which helps to make sense of the world and how things are represented by language and symbols. A child remembers previous experiences and develops expectations. In the stage of concrete operations, logic develops and the child learns to organize his/her thoughts by ordering and classifying objects. The child must manipulate objects and needs hands-on activities to solve problems, and learn cause and effect relationships. The final stage, formal operations, involves abstract reasoning and the linkage of concepts. The individual is able to mentally manipulate symbols, rather than concrete manipulatives, and can hypothesize and predict events and consequences.

Individuals with Down syndrome take longer to learn, but show the same sequence of stages of concept attainment. However, their patterns develop at a slower rate, which necessitates attention to the mental age of Piaget's stages, rather than chronological age as he originally discussed. Mental age has been explained as IQ = Mental Age/ Chronological Age X 100. For example, a 13 year old child with Down syndrome could be expected to need tokens, rods or other concrete items to help solve math problems, because he is still operating in the stage of concrete operations, even though his chronological age would fall in the formal operations stage.

Suggestions for Classroom Practice

1. Children with Down syndrome learn best by active participation, rather than sitting and listening.
2. Allow for manipulation of concrete materials to solve problems and maintain interest.
3. As learning occurs in an ordered sequence, tasks should be presented step by step, making sure that the child has the pre-requisite concepts for the next step or level.
4. Be guided by the individual's mental age: his/her logic, interpretation of the problem and expression of an answer may be different than what is expected from chronological age.

Mediational Strategies and Paired Associates

Every individual varies on his/her ability to organize thought processes, store information and recall it as needed. As mentioned in the discussion on memory, individuals with Down syndrome have difficulty in this area, which is heavily based on language and ability to categorize. Research has documented that slower learners will approach learning and memorization activities in the same way or style as younger peers do, relating expectations for this ability to mental age instead of chronological age (Brown, 1974; Spitz, 1966). Presenting new material to be learned in groups or clustering material in an organized fashion helps to facilitate learning. Spontaneous, or good learners, do this automatically, while poor learners need more structure or help in this area.

The most common type of grouping arrangements are according to physical similarities (same color or shape), functional categories (food or clothing), concepts (object permanence) and sequence or equivalence (pattern arrangement or order). A mediator is some prompt or cue that connects or links a stimulus and response to be learned. Paired associate learning is the ability to link concepts, ideas or words, such as people or places. Repetition, rehearsal or drill is then used for memory. Serial learning of concepts is when you pair concept A to B (e.g. If you touch a stove, it is hot), then B to C (if you touch something hot, you get burned). The final conclusion is A to C (if you touch a stove, you get burned).

Sometimes when we teach slower learners, we need to introduce a mediator, (or concept B) to break down a concept that may be too abstract to grasp on its own. In this example, concept B, or the mediator, is the concept of "hot." Other elaboration strategies include prepositional mediators (e.g. book "on the" table), interrogative mediators ("where is the" book? On the table.), and visual imagery (imagine a book on a table). Research has indicated that students who are educationally challenged have difficulty producing these mediational strategies to help them break down and combine concepts, but these can be developed and learned (Robinson and Robinson, 1976; Bray, 1979).

Suggestions for Classroom Practice

1. Restructure or organize visual and/or auditory presentations to break down the relationships to basic concepts, such as size, shape, pattern or categories.
2. Sequence activities from simple to complex with time lapses to facilitate responding from language or cognitive processing delays. Increasing response time allowed has been shown to improve learning abilities of slow learners (Judd and Bilsky, 1989).
3. Verbalize and repeat the instructional links between concepts.
4. Use meaningful and familiar, relevant materials.
5. Repeat, rehearse and drill often.
6. Employ and train mediational strategies.

Transfer of Learning

The learning abilities of individuals with Down syndrome can be improved through highly structured, meaningful activities that are analyzed and sequenced from simple to complex. However, transfer of learning, or generalization of the learned concepts to different situations, materials and environments is very difficult. Individuals with Down syndrome typically show deficiencies in the ability to apply old knowledge or skills to new tasks or places (Stephens, 1972). Such difficulties usually come from the inability to recognize similarities between problems and situations (Stevenson, 1972). For example, some students who have learned to add numbers in school, would not be able to compute simple addition in a shopping situation. These students would not associate the learning in the classroom to the store environment. Also, these individuals do not use previous experiences to help solve future problems (Robinson, and Robinson, 1976), which leads to the phenomena that teachers often report, that their students learn something one day but forget it the next.

Suggestions for Classroom Practice

1. Use meaningful materials and experiences, to cut down on novelty which could confuse the learner.
2. Teach concepts in a variety of different learning environments and with different people, pointing out similarities and differences between them.
3. Use frequent review and repetition.
4. Practice newly learned skills with different people, materials and environments.
5. Use both verbal explanations and performance activities.

Motivation

Students with Down syndrome often seem stubborn or "passive" and uninterested in learning, but this can be misleading! Even before schooling begins, children with Down syndrome have frequently experienced failure due to delays with developmental milestones such as walking and talking. They may have also experienced negative responses from other

adults and children. Because slower learners have a history of lower performance levels, they sometimes devote their energy to avoiding another failure rather than striving for success. Slower learners also settle for smaller degrees of success than their potential or capabilities allow. Typical behaviors that can be expected of slower learners are: they learn to expect corrections or criticism and are not surprised; they react passively or impulsively by making stereotyped responses, such as select the first choice, or say "I don't know;" they avoid situations prone for failure by asking to go to the bathroom, or by cutting class; and they sometimes accept a lower level of success, such as doing one problem correctly, without striving for a higher grade.

Zigler (1973) has documented that some slower learners have a dependency on external cues (called "outer directedness" or "external locus of control") and work less independently. They also attribute success or failure to outside cues (it was too noisy, the question was bad, I was lucky), and not themselves or their ability. If they experience constant correction and criticism, they may give up and wait for someone else to answer the problem or perform the task, a situation called "learned helplessness." Thus, individuals with Down syndrome will probably need much more encouragement and positive feedback than the average learner. They will also need an accepting environment in which they can feel free to make mistakes and attempt to become more independent. Self-monitoring of performance should be encouraged.

Suggestions for Classroom Practice

1. Assign tasks that are appropriate to developmental level and are well explained.
2. Create a success-oriented atmosphere.
3. Use attractive, meaningful, familiar materials.
4. Allow students to participate in developing the rules or the design of the lessons.
5. Provide external cues and rewards, then gradually fade them so the rewards become internally based, and the student remains motivated.
6. Discourage the students from constantly seeking help, and reward independence.
7. Encourage social rewards and becoming buddies with peers.
8. Use positive language like "try another way" or "think it through again," rather than "you're wrong."

Conclusion

Learning is a process whereby practice or experience produces a change in behavior that is not due to maturation. It is a hypothetical construct that is difficult to measure except by observing performance. Individuals with Down syndrome usually perform below average on tests of intelligence and are also inefficient learners (Bierne-Smith, Patton and Ittenbach, 1994). They do not learn spontaneously from their experiences and need new concepts to be clearly presented in a sequenced format. They have slow processing of verbal information and limited retention of new concepts and details. However, children with Down syndrome can benefit from education in regular classroom situations and do make academic gains. Their

learning problems are a result of differing learning styles rather than learning impediments. Use of teaching methods that involve physical participation and visual cues or objects is very effective with learners with Down syndrome, and it is not very difficult for a teacher trained in these techniques to modify curriculum in this manner.

To summarize, the learning characteristics of children with Down syndrome are more similar to their regular education peers than they are different. However, language and motivational deficiencies may necessitate more highly structured, sequenced activities, with smaller bits of information presented at a time, and lots of rewards and praise built into the design of the lesson. Meaningful, familiar materials work the best, and adequate time should be allowed for processing a response.

Recommendations to Practitioners: Be Enthusiastic and Flexible

Inclusion is a very successful, acceptable option for most children with Down syndrome. Little difference, if any is noticeable in a class between the children with Down syndrome and their typical education peers as young children. They usually play and get along well with other children. Friendships are formed in the classroom situation and at recess. In this study there were few cases where expressive language differences and stubbornness were concerns, but this is also a common complaint for many children across all early childhood programs. (Smart and Smart, 1973).

In the lower and upper elementary grades, teacher concerns regarding inclusion can be separated into three areas: 1) speech and language difficulties; 2) getting information from reading; and 3) math ability and problem solving. The limited number of high school responses prevents any judgments or conclusions.

Speech and Language

Speech and language problems have been known to occur more frequently among individuals with Down syndrome (Macmillan, 1982). Most teachers report difficulties due to 1) articulation problems, and 2) limited semantic concepts. This is understandable when one considers the learning style and genetic nature of Down syndrome. Many children with Down syndrome have a protruding tongue which affects the clarity of speech. Tongue reduction surgery has received much support from parents (Lemperle, 1985; Olbrisch, 1982), although many professionals do not find better articulation patterns in those children who have had the surgery (Parsons, Iacone and Rozner, 1987). Using contextual cues can help teachers to understand their students with Down syndrome, as well as asking the students to repeat what they say a little more slowly.

Children with Down syndrome also have frequent middle ear infections, which can cause conductive hearing losses that can result in delayed language and speech problems (Balkany, Downs, Jafek and Krajicek, 1979). Semantic concepts can also be delayed due to their focusing on auditory language sequences (actual words and sounds), rather than underlying semantic or conceptual aspects (meaning). This can eventually lead to frustration with language, and disruptive behavior (Abbeduto and Nuccio, 1991).

The implications for teachers is that care must be given to the way directions for activities are explained, or questions are asked (e.g. "circle the..., in front of the..), as students with Down syndrome may have delayed language concepts. Also, if a student is being disruptive, it could be because they are not processing the language of the lesson. Sometimes, using a visual aid can help to convey the concept .

Reading

Reading researchers have discussed the strong relationship between self-concept and reading achievement (Wattenberg, 1964; Thompson and Hartley, 1980; Cecil, 1990; Gillet and Temple, 1994). This is of particular concern for included students with Down syndrome, because there are implications that poor reading performance can be associated with slower social development. Therefore it is important for teachers to allow reading to sometimes be a social or fun activity. Reading is made up of several components which may be more difficult for the students who are educationally challenged: 1) sensory/perceptual (hearing the sounds, seeing the letters); 2) sequential (left to right, top to bottom on page; also grammar rules for meaning); 3) experiential (vocabulary, understanding of concepts); 4) learning/ association (linking what is read to real life situations; transfer and generalization of information); and 5) affective (reading for pleasure, attitudes and interests). Students with Down syndrome need help focusing their attention on reading activities, and sustaining their attention over a period of time. When teachers break the story down into smaller parts and give a purpose for reading each part, it helps to motivate the student (Reis, 1986). Individual pacing helps a student with mental retardation feel more accepted as part of the group. Also, frequent review and re-reading helps to facilitate comprehension.

Suggestions for Classroom Practice

1. Use previous experiences of students to select reading topics.
2. Teach vocabulary words in context and review frequently.
3. Provide a variety of experiences to encourage re-reading for practice, such as paired reading or role playing.
4. Encourage students to self-monitor their own reading and ask questions.
5. Ask students to sequence the events of the story.
6. Teach students to use contextual cues for comprehension.
7. Encourage writing or re-telling of the stories.
8. Have students predict expectations for what they read.
9. Use multiple choice questions to assess reading comprehension if writing is difficult for the child.

Math Skills

In order to better understand how children with Down syndrome learn math skills, it is helpful to separate them into the two areas: 1) arithmetic/computational skills, and 2) word problem solving/concepts.

Arithmetic computation involves two distinct processes that entail different skills. When a student first learns how to perform an arithmetic skill, he/she learns the procedures for performing the operation, or computation. Once these skills are repeatedly practiced, the computation is stored in a memory network, and becomes part of that student's "declarative

knowledge." The student with Down syndrome has great difficulty achieving the stage of declarative knowledge, and will often learn something only to forget it the next day. Sometimes a visual cue or "song" helps to prompt the computational memory. It is also helpful to allow the student with Down syndrome to use as many manipulatives or concrete activities as possible to physically perform or experience the computation. Peer tutoring and computer assisted instruction is also very helpful and motivating for the student. Some teachers also allow the use of calculators, although this has had mixed results with children with Down syndrome due to fine motor difficulties (Friedman, 1991).

The solution of arithmetic word problems is an area of great difficulty for many students with Down syndrome (Friedman, 1991; Judd and Bilsky, 1989; Narayanan, 1983). Solving word problems is made up of two abilities: 1) understanding what is being asked, and 2) selecting and implementing a solution strategy. The first ability is heavily dependent on language and math concepts linked to vocabulary. In order to help a student with Down syndrome, teachers should explain the language or the vocabulary of the problem first. Again, a visual aid or concrete manipulative may be helpful to give an example. Memory is also a factor in this ability, so it may be helpful to repeat the problem or allow enough time for language processing. The second ability relates to recognizing the type of problem being asked (addition, subtraction, multiplication, division), pulling out the relevant factors of the problem, and performing the correct operation for solution. As a final goal for a student with Down syndrome is community participation and independence, rehearsal and repetition of practical problems would be helpful to prepare the student for future real-life math skills. Again, since transfer and generalization of skill is also an issue, care should be taken to role play or to visit the exact environment in which the skill will have to be performed (e.g. restaurant, store). Teaching independence and self-monitoring of math computations and problem solving is also important. Peer tutoring and computer assisted instruction are enjoyable, motivating methods for practice.

Suggestions for Classroom Practice

1. Look at individual common error patterns to try and decipher concept deficiencies.
2. Practice skills continually for fluency and automaticity.
3. Make sure student has developmental pre-requisites: one-on-one correspondence, more or less, quantity and numeration precedes computational skill.
4. Encourage the students to learn different problem solving strategies, pointing out commonalities and differences in concepts.
5. Show and label common word problem solving formats that can cue certain operations, such as addition and subtraction (e.g. "all together," "fewer than").
6. Teach the child how to identify relevant and ignore extraneous information in math problems.

Concluding Remarks

Recent trends in education and attitudes have become more accepting of differently abled students. This study has shown that the inclusion of students with Down syndrome in typical education classes is a valid option for educational programming. However, much administrative support is needed to provide well planned transitions and training of personnel. Good communication among parents and a multitude of professionals is the key to success with inclusion.

The learning characteristics of students with Down syndrome are more similar to their regular education peers than they are different. However, language and motivational deficiencies may necessitate more highly structured, sequenced activities, with smaller bits of information presented at a time, and lots of rewards and praise built into the design of the lesson. Meaningful, familiar materials work best, and adequate time should be allowed for processing a response.

Thank you to all of the teachers and parents who participated in this study. Many parents had concerns about the educational adjustments that were necessary for their children placed in the typical education classes, but maintained their enthusiasm and optimism. Parents reported that they often provided information about their child's special needs instead of the school district. They recommend that parents new to the inclusion process balance persistence in the search for the best educational program for their children with patience and assistance in times of difficulty. Also recommended was "Negotiating the Special Education Maze" (Anderson, W., Hayden, D. And Chitwood, S., 1990).

Almost all of the teachers reported that they enjoyed the experience of teaching included students with Down syndrome. Teachers found the students responsive and eager when given any kind of encouragement. There were reported differences in learning styles that necessitated some modifications, such as fewer questions, different expectations and simplified curriculum. One teacher stated, "The best advice I could give to any new inclusion teacher would be to keep calm, get all of the information you can about the student and be enthusiastic and flexible." Another teacher summed up her response by saying, "I found inclusion to be the single most interesting and rewarding experience of my teaching career. I would advise new inclusion teachers to make friends with the students and go with the flow." The general consensus among educators is that "inclusion is a lot of work, but definitely worth it."

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APPENDIX A

DOWN SYNDROME EDUCATION SURVEY
PARENT SURVEY

We are looking at the ways that school systems provide services to children with Down syndrome who are in inclusive classrooms. Please feel free to use additional sheets of paper if you have any comments, questions or suggestions. Your input is greatly appreciated. All responses are confidential.

Background Information

1. School district: _____

2. Size of district: _____

3. Is this the district that your child would attend if he/she did not have Down syndrome? Please explain any special arrangements which may exist.

_____

_____

_____

_____

4. Do you have any other children who have attended (or currently attend) this school district?

_____

_____

_____

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5. Does your school district have a mission statement? Is any mention made of students with disabilities or inclusion? Please enclose a copy if possible.

_____

_____

6. Is your community urban:_____suburban:_____rural:_____?

Classroom Information

7. Child's age:_____grade:_____years included:_____

Please include a description of your child's classroom, paying attention to the following points:

8. Is your child in a regular education classroom?

_____

9. How many children are in the class?

_____

10. Is your child the only student with Down syndrome in the classroom? Are there any other students with disabilities in the classroom?

_____

_____

11. What is the teaching arrangement?

_____

_____

_____

12. Are there computers in the classroom?

_____

_____

13. Please comment on any facet of the classroom situation which you feel is relevant to the inclusion process. For example, is the class well-managed? are appropriate supports available to deal with behavior problems? are the children considerate? is it resource rich? are teachers supportive?

_____

_____

_____

_____

_____

Transition

14. Prior to being included, what type of educational arrangement did your child have?

_____

_____

_____

15. Was it difficult for you to obtain an inclusive setting for your child? Please describe how inclusion came about.

_____

_____

_____

16. Was any preparation or orientation given to your child, his or her classmates or his or her teacher before inclusion took place? Please comment on any part-time placement, trial period, workshop for parents, information session for classmates or other type of preparation.

_____

_____

_____

Parental Involvement

17. How much did you participate in the development of your child's IEP? Do you and the teacher agree on the goals set forth in the IEP?

_____

_____

18. Do you find it easy to communicate with your child's teacher(s)? What about the school principal or other support personnel? Please comment on your communication with both regular and special education teachers, physical and occupational therapists, speech and language pathologists and any additional aides.

_____

_____

19. Have any of your child's teachers or aides asked you for educational/behavioral/background information about your child?

_____

_____

_____

20. Have you had any interaction with the parents of regular students regarding inclusion? Has this interaction been positive or negative?

_____

_____

_____

21. Do you feel that school personnel treat you differently than the parents of children who do not have special needs? Please explain.

_____

_____

_____

Child's Experience

22. How has your child adjusted to being in an inclusive setting? Have you noticed any changes in behavior, attitude, motivation, self-esteem, or personality since he or she has been in a regular classroom?

_____

_____

_____

23. Did you (or do you, on a continual basis) do anything to help your child adapt to being in a regular classroom? Please explain.

_____

_____

_____

24. What aspects of being included have been most beneficial for your child? Social interaction? academic challenge? positive behavior models? speech imitation? team teaching? other? Please describe.

_____

_____

_____

25. What do you see as the drawbacks of inclusion? Has inclusion been difficult for your child in any way?

_____

_____

_____

26. Does your child get homework? Is it similar to that of other students? Are you allowed to, or must you, help?

_____

_____

27. Has your child lost or gained specialized services since inclusion began? Please comment on the need for, and availability of, such services as speech, physical therapy, occupational therapy, transportation, etc.

_____

_____

_____

Child's Personal Experience

28. Does your child have any behavior problems which require special attention? If so, are these problems new or have they changed since your child has been in an inclusive setting. How are these problems managed in the classroom?

_____

_____

29. Does your child talk about his or her school experiences at home? Are comments generally positive or negative? What types of things does he or she say? Has school-related dialogue between you and your child changed at all since inclusion took place?

_____

_____

_____

30. Does your child have any contact with classmates outside of school (birthday parties, sports, extracurricular activities, play dates, etc.)?

_____

_____

_____

Evaluation

31. How would you rate the attitude toward inclusion of the following individuals? Please use a scale of one to five, with one being not enthusiastic at all, and five being very enthusiastic. Please mention (and rate) any individual whose participation in the inclusion process has been significant.

*school principal	1	2	3	4	5
*classroom teacher	1	2	3	4	5
*special ed. personnel	1	2	3	4	5
*other_____	1	2	3	4	5

32. Is inclusion, as carried out by your district, better or worse than you expected?

_____

_____

_____

33. Could it be improved for next year?

_____

_____

_____

34. If you had to give advice to another parent who was about to enter "inclusion" for the first time, what would you say are the three most important components to a successful inclusion experience?

_____

_____

_____

35. How do you think the educational needs of children with Down syndrome differ from those of other children who have IEPs? Is it your opinion that these goals can be met in an included setting?

_____

_____

36. Have the long term goals that you have for your child changed in any way since your child has been included?

_____

_____

_____

_____

37. Overall, would you say you are satisfied with your child's education in the regular classroom?

_____

_____

_____

Would you like:

more information about NDSS?_____
to be added to our mailing list?_____
a copy of the information from this study?_____

Name:_____

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APPENDIX B

DOWN SYNDROME EDUCATION SURVEY
TEACHER SURVEY

We are looking at school systems that provide inclusive settings to children with Down syndrome across America. Please feel free to use additional sheets of paper if you have any comments, questions, or suggestions. All responses are confidential. Your input is greatly appreciated.

Background Information

1. Is your community urban:_____suburban:_____rural:_____?

2. School district:_____

3. Size of district:_____

4. Does your school district have a mission statement? Is any mention made of students with disabilities or inclusion? Please enclose a copy if possible.

_____

_____

_____

_____

5. Has your school district had any previous experience with inclusion? Please explain.

_____

_____

_____

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Teacher Information

6. How long have you been teaching?_____

7. What is your educational background? Please comment on any special preparation, degrees or training. Be sure to mention any special education training you have had.

_____

_____

_____

8. Is this your first experience with inclusion? If so, how did it come about?

_____

_____

_____

9. What grade(s) do you teach?_____

Transition

10. Did you, or do you, receive any inclusion training from the school? Please describe.

_____

_____

11. Was any preparation or orientation given to the child with Down syndrome or his or her classmates before inclusion took place? Please comment on any part-time placement, trial period, workshop for parents, information session for classmates or other type of preparation.

_____

_____

_____

Classroom Information

12. How many children are in the class?

_____

13. How many children with Down syndrome are in the classroom and what are their ages? How many other students in the classroom have IEPs? Please explain.

_____

_____

_____

_____

14. What is the teaching arrangement? Please be explicit about any team teaching, co-teaching, collaboration or support.

_____

_____

_____

_____

15. How many additional staff are involved in the education of the child with Down syndrome? This includes aides, speech and language pathologists, physical and occupational therapists, psychologists, and any other "special service" providers.

_____

_____

_____

_____

_____

16. How are special services or therapies provided? push-in? pull-out? with additional help in the classroom? Please describe.

_____

_____

_____

_____

17. Are there computers in the classroom?

_____

Classroom Instruction and Teaching Strategies

18. What is the physical arrangement of the class? Where does the student with Down syndrome sit in the classroom? Please draw, and explain, if possible.

_____

_____

_____

19. Where do you spend most of your instructional time? At the blackboard, your desk, the students' desk? Please describe.

_____

_____

20. Please comment on the effectiveness of the following learning arrangements for the student with Down syndrome. Use a scale from one to five, with one being the least effective and five being the most effective.

*individual instruction by teacher	1	2	3	4	5
*small group (4-6 children)	1	2	3	4	5
*large group (7 or more children)	1	2	3	4	5
*whole class	1	2	3	4	5
*peer tutor	1	2	3	4	5
*computer	1	2	3	4	5
*team-teaching	1	2	3	4	5

21. Do you have to modify assignments for the student with Down syndrome? Please describe.

_____

_____

_____

22. Do you have to modify tests or evaluations for the student with Down syndrome? Please describe.

_____

_____

_____

23. Do you need more support and information from the parents of the student with Down syndrome than you do from the parents of other children with special needs?

_____

_____

24. Does the student with Down syndrome have to follow the same classroom rules as other children?

_____

25. How are these rules communicated? Are they written, oral or visual? Are they posted on walls? Are they communicated by peers or by yourself? Please explain.

_____

26. What materials work best for the child with Down syndrome? Please comment on the following. Use a scale from one to five, with one being the worst (ineffective) and five being the best (very effective).

*paper and pencil	1	2	3	4	5
*workbook	1	2	3	4	5
*reading book (text)	1	2	3	4	5
*manipulation of items	1	2	3	4	5
*computer	1	2	3	4	5
*other (please specify)	1	2	3	4	5

_____

_____

_____

27. Does the student with Down syndrome have the same homework assignments as other students or are they modified? Please describe.

_____

_____

_____

28. To what extent do you think homework assignments are an effective tool for helping students with Down syndrome learn?

_____

_____

29. How do your expectations and/or grades for the student with Down syndrome compare to those for other students?

_____

_____

30. Who works most effectively with the student with Down syndrome? you? an aide? other students? another teacher? Please explain.

_____

_____

_____

31. Which aspects of the education process are most important in making up a grade or determining what the student with Down syndrome knows? Please comment on the following. Use a scale from one to five, with one being the least important and five being the most important.

*homework	1	2	3	4	5
*daily work in class	1	2	3	4	5
*tests	1	2	3	4	5
*class participation (verbal)	1	2	3	4	5
*class participation (physical)	1	2	3	4	5
*effort	1	2	3	4	5

32. Is this method of evaluation different from that of other students?

_____

_____

_____

33. Would you classify the student with Down syndrome as an active or a passive learner?

_____

_____

34. Which of the following would help you improve your instruction to the child with Down syndrome? Use a scale from one to five, with one being the least helpful and five being the most helpful.

*more planning time	1	2	3	4	5
*more consultation with special education teachers	1	2	3	4	5
*more one-on-one instruction time	1	2	3	4	5
*peer tutoring	1	2	3	4	5
*more information about the learning characteristics of students with Down syndrome	1	2	3	4	5
*additional support from the school administration	1	2	3	4	5
*more input from parents	1	2	3	4	5
*less paperwork	1	2	3	4	5
*additional help in the classroom	1	2	3	4	5

35. Please comment on any facet of the classroom situation which you feel is relevant to the inclusion process. For example, is the classroom environment conducive to learning? Are appropriate supports available to deal with behavior problems? Are the children considerate? Is it resource rich? Are peers supportive?

_____

_____

_____

_____

_____

Behavior

36. How does the student with Down syndrome interact with other classmates?

37. Do you have any influence over these interactions?

38. How do you promote peer responsibility and friendship?

39. Do you notice any unique behavioral problems in the child with Down syndrome as compared to other students?

40. Do you have to modify your system of behavioral management in any way for the student with Down syndrome?

41. Please comment on the effectiveness of the following responses for the behavior management of the child with Down syndrome. Use a scale from one to five, with one being the least effective and five being the most effective.

*material rewards	1	2	3	4	5
*praise	1	2	3	4	5
*ignoring	1	2	3	4	5
*time out	1	2	3	4	5
*loss of activity or privilege	1	2	3	4	5
*reprimands	1	2	3	4	5
*lower grade, loss of star	1	2	3	4	5
*punishment	1	2	3	4	5
*peer pressure	1	2	3	4	5
*contacting the parent	1	2	3	4	5
*other _____	1	2	3	4	5

Evaluation

42. Is inclusion, as carried out by your district, better or worse than you expected?

_____

_____

_____

43. Could it be improved for next year?

_____

_____

44. How do you think the educational needs of children with Down syndrome differ from those of other children who have IEPs? How does this affect your method of instruction?

_____

_____

_____

45. Do you feel you have enough knowledge about Down syndrome to adequately plan for the student(s)?

Yes_____ No_____

46. If more information about the learning characteristics or social needs of children with Down syndrome were available would you be interested in seeing it? Specifically, what type of information do you think would be helpful?

_____

_____

_____

_____

47. Do you have any additional comments?

_____

_____

_____

_____

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_____

NOTES

The National Down Syndrome Society was established in 1979 to ensure that all people with Down syndrome are provided the opportunity to achieve their full potential in community life. This mission is being fulfilled through education, research and advocacy.

NDSS supports researchers seeking the causes of, and answers to, many of the medical, genetic, behavioral and learning problems associated with Down syndrome; sponsors internationally renowned scientific symposia and conferences for parents and professionals; advocates on behalf of families and individuals affected by this condition; provides information and referral services through its toll-free number; and develops and disseminates educational materials for individuals with Down syndrome, parents, teachers, researchers and health professionals.

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